

Remarks

Claims 30 and 40-45 are now pending in this application.

In the Office Action dated August 23, 2006 the Examiner rejected claims 30 and 40-45 under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement. Claims 30 and 41-45 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Reny, WO89/09806. Claim 40 stands rejected under 35 U.S.C. § 103(a) as being obvious in view of Reny, WO89/09806. Claims 30 and 40-45 stand rejected under 35 U.S.C. § 103(a) as being obvious in view of in view of Meyer et al., Patent No. 5,118,434, or in view of Maes et al., U.S. Patent No. 5,366,651. Claims 30 and 40-45 also stand rejected under 35 U.S.C. § 103(a) as being obvious in view of Wood, U.S. Patent No. 4,455,248. Claims 30 and 40-45 were also provisionally rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-9, 11 and 12 of copending Application No. 10/264,041; claims 27-50 of Application No. 09/910,497; and claims 22-29 of Application No. 10/935,897. Applicants respectfully request reconsideration in view of the amendments to the claims and the remarks set forth below.

Claim 30 as previously amended recites a method for reducing the oral toxicity of an ethylene glycol based, non-aqueous heat transfer fluid. The method comprises mixing a non-aqueous, ethylene glycol based heat transfer fluid with propylene glycol to achieve a propylene glycol concentration of between about 5 percent by weight and 30 percent by weight of the total weight of the ethylene glycol and propylene glycol in the resulting non-aqueous heat transfer fluid. Claim 30 further recites that the non-aqueous heat transfer fluid resulting from combining the ethylene glycol based fluid and the propylene glycol has an LD₅₀ for oral toxicity in rats of greater than 10,000 mg/kg. Claim 30 further recites that the resulting non-aqueous fluid contains at least one corrosion inhibiting additive that is soluble in both ethylene glycol and propylene

glycol, and that wherein the resulting heat transfer fluid contains no additive that requires water to dissolve the additive or to enable the additive to function.

Claims 40-45 all depend from claim 30 and recite further embodiments of the invention.

Rejection of Claims 30 and 40-45 Under 35 U.S.C. § 112

Claims 30 and 40-45 stand rejected under 35 U.S.C. § 112 first paragraph on the grounds that the specification does not provide any basis for an LD₅₀ “greater than 10,000 mg/kg” because the term has no upper limit. As discussed below, the examiner has taken the cited phrase out of context, and when the phrase is read in the context of the entire limitation in which it appears, the limitation is plainly supported by the specification.

The phrase cited by the examiner appears in a limitation that recites “wherein the resulting fluid has an LD₅₀ value for oral toxicity in rats that is greater than 10,000 mg/kg.” Thus, the recited limit must be read as it applies to the LD₅₀ value in rats, not simply standing alone.

As described in the specification at page 5, line 18 through page 6, line 8, and as understood by those skilled in the art, the LD₅₀ value for oral toxicity is the dosage at which 50 percent of the rats fed a particular substance die. The quantity fed to each rat is measured as a dosage in mg (composition)/kg (rat weight). If the dosage is greater than the LD₅₀ value, then 50 percent or more of the dosed rats would be expected to die. On the other hand, if the dosage is less than the LD₅₀ value, fewer than 50 percent of the dosed rats would be expected to die. A lower LD₅₀ value indicates higher toxicity (i.e. smaller amounts of the substance can be lethal). Therefore, the limitation in claim 30 means that, for the fluid produced by the claimed methods, dosages of 10,000 mg/kg or greater are required to cause the death of 50 percent or more of the given rat population.

In the context of an LD₅₀ value limiting oral toxicity, the only parameter of importance is the lower limit. At higher values, the toxicity is lessened, while at values below the stated limit,

the toxicity of the substance is increased. Indeed, as pointed out in the specification at page 22, lines 11-19, in one test it was not possible to determine the LD₅₀ value of the fluid because no rat deaths occurred at doses of 21,000 mg/kg, the maximum amount that could be fed to the rats. Indeed, in this context, to recite an upper limit would, in fact, render the claim indefinite, as it would not be clear at what dosage level the LD₅₀ value must be achieved. The limitation as written requires that at least 10,000 mg/kg of the composition can be fed to a population of rats, and that such a dosage will cause no more than 50 percent of the rats to die.

Accordingly, for at least the reasons stated above, as well as the reasons stated in the paper filed by the applicant on May 30, 2006, claim 30 as currently presented is fully supported in the specification, and the rejection under 35 U.S.C. § 112 should be withdrawn.

The Rejections Under 35 U.S.C. §§ 102(b) and 103(a) Based Upon Reny

Claims 30 and 41-45 stand rejected under 35 U.S.C. § 102(b) as anticipated by Reny, WO89/09806. To anticipate a claim under Section 102(b), a single prior art reference must disclose each and every element set forth in the claim. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987); MPEP § 2131. Reny does not disclose any composition that meets all of the limitations of claim 30 as amended. Specifically, Reny does not disclose a non-aqueous heat transfer fluid comprising ethylene glycol and propylene glycol that contains no additives requiring the presence of water to dissolve the additive or to enable the additive to perform its intended function.

Applicant respectfully maintains that when Reny is read in full in view of what was known to those skilled in the art at the time that the present application was filed, it is plain that Reny does not anticipate the present claims. At page 5 of the Office Action, the examiner states that Reny at p. 3 lines 1-15 describes an embodiment that “contains no water.” In fact, Reny does not describe any specific embodiment that contains no water. Moreover, all of the

embodiments described by Reny containing ethylene glycol and propylene glycol contain added water.

The composition described in Reny at page 3 comprises “at least 90 weight percent of an alkylene glycol or a mixture of two or more alkylene glycols” and “from 0 to 3 weight parts of phosphoric acid.” Reny does not describe on page 3 which embodiments of the invention may contain no added phosphoric acid. However, Reny later explains that phosphoric acid is added “to maintain the pH of the coolant composition in the range of from 7 to 9, preferably from 7 to 8, and only if necessary.” Reny, p. 5, lines 22-24. For phosphoric acid to function in a manner as to affect pH, water must be included in order for the phosphoric acid to ionize. Therefore, *the fluid described in Reny contains no water only when phosphoric acid is not necessary for the control of pH.*

The composition described on p. 3, lines 1-15 of Reny, and cited by the examiner, does not mention alkaline buffers. However, later in the specification, Reny states that if the composition is too acidic, “sodium or potassium hydroxide [should be added] until a pH of from 7 to 9 is reached.” Reny, p. 6, lines 3-5. Sodium hydroxide and potassium hydroxide are alkaline buffers that also require water in order for them to function.

The set of alkylene glycols is very large and is comprised of ethylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, propylene glycol, dipropylene glycol, hexylene glycol, 2 ethyl-1,3-hexanediol, 1,5-pentanediol, *and many others*. Reny also adds glycerol (which has three hydroxyl groups) to the list by referring to it as an alkylene glycol. Reny, page 4, lines 3-4. There may be alkylene glycols or mixtures of them for which buffering would not be necessary. Indeed, on p. 5 lines 24-26, Reny says that “Some alkylene glycol mixtures are within the pH limits, and in such cases no pH adjustment is required.” Reny, however, does not specify any glycols or mixtures that do not require pH adjustment. Rather, Reny, by his examples in the specification, teaches that for propylene glycol and for mixtures containing propylene

glycol and ethylene glycol, the addition of phosphoric acid is necessary for pH control. Reny, pages 7-9.

Although Reny states that some undefined compositions might not require added water, the more important teaching of Reny, which is directly relevant in this case, is that *the compositions should not be too alkaline or too acid*. Reny states that if the compositions are too acid or too alkaline, they should be buffered to give them a pH in the range of 7 to 9. Whether buffered by phosphoric acid (to make the composition less alkaline) or by sodium or potassium hydroxide (to make the compositions more alkaline), water is required in the composition in order for the buffer to function. Specifically, Reny teaches that compositions of propylene glycol and mixtures of propylene glycol and ethylene glycol must contain phosphoric acid and, of course, water. In contrast, the Applicant teaches that **regardless of the pH**, buffering is unnecessary and water should never be added for any reason at all.

The examiner's conclusion on pages 5-6 of the Office Action that the coolant composition described on page 9 of Reny, which describes a coolant that contains 1 part water, anticipates the claimed invention is incorrect for at least two reasons. First, the statement in the present application regarding the presence of up to 0.5% water in the heat transfer fluid of the present invention refers to water present *as an impurity*. No water is added to the composition, and indeed no added water is required because the heat transfer fluid does not contain any additives requiring water to be present in the fluid. The fluid described at page 9 of Reny comprising ethylene glycol, propylene glycol and corrosion inhibitors includes added water to hydrolyze the phosphoric acid present in the composition.¹

¹ The only composition described in Reny containing no added water is a control sample having only ethylene glycol and propylene glycol without corrosion inhibitors. Reny teaches that this composition is not acceptable for use due to the very high corrosion rates reported with the fluid.

More importantly, the fluid described at page 9 of Reny contains at least 0.985% water (1 part water/101.475 parts total ingredients). Thus, Reny *adds* twice the quantity of water that the present applications states can be present *as an impurity*. Accordingly, the fluid does not anticipate the methods of claims 30 and 41-45 for at least this reason.

At page 11 of the Office Action, the Examiner states that Reny at page 5, lines 25-35 describes a compositions containing less than 1% water, and therefore anticipate the present claims. In the portion of Reny cited by the Examiner, Reny does not disclose any particular combinations of any alkylene glycols, much less describe combinations of ethylene glycol and propylene glycol. Rather, Reny merely describes in a generically combinations of “alkylene glycols”. Reny goes on to state that “The coolant composition of the present invention is prepared by first dissolving up to 10 weight percent of water in the alkylene glycol.” Although Reny goes on to state that preferably as little as about 1 weight percent may be added (which Reny defines as “essentially no water”). In the very same paragraph at page 6, lines 2-7, Reny goes on to state that additives requiring water are added to adjust the pH, and one of these additives, phosphoric acid, is added in the examples described by Reny that contain ethylene glycol and propylene glycol. Accordingly, when Reny is read as a whole, he plainly teaches that heat transfer fluids comprising ethylene glycol and propylene glycol require buffers and added water. As set forth in the Declaration of John Evans submitted herewith, the addition of water and buffers to such fluids was consistent with the understanding of those skilled in the art at the time.

The examiner states at page 6 of the Office Action that claim 40 is rejected under 35 U.S.C. § 103(a) because it would have been obvious to one skilled in the art to reduce the toxicity of ethylene glycol by mixing ethylene glycol with a polyhydric alcohol such as glycerol. Applicants note that claim 40 was previously amended and no longer recites the combination of

ethylene glycol with a polyhydric alcohol such as glycerol. Rather, claim 40 as currently presented recites a composition comprising ethylene glycol and propylene glycol.

Reny does not teach or suggest the combination of ethylene glycol and propylene glycol in the amounts recited in claim 40. Moreover, as described above, Reny does not teach any combination of ethylene glycol and propylene glycol without the addition of phosphoric acid and water for any purpose, much less to reduce the oral toxicity of the resulting fluid. Reny does not even mention oral toxicity, much less teach or suggest a solution to that problem. Moreover, for at least the reasons presented in the specification at pages 21-24, the reduction in oral toxicity achieved with fluid of the present was unexpected.

For at least the reasons set forth above, as well as the reasons set forth in the paper filed by the applicant on May 30, 2006, Reny does not describe, or otherwise teach or suggest, a heat transfer fluid as defined in the specification and recited in claims 30 and 40-45 comprising ethylene glycol and propylene glycol and that does not contain any additives that require water to dissolve the additives in the fluid or to enable the additives to function in the fluid.

The Rejection Under 35 U.S.C. § 103(a) Based Upon Meyer or Maes

Claims 30 and 40-45 stand rejected under 35 U.S.C. § 103(a) in view of Meyer, U.S. Patent No. 5,118,434 or Maes, U.S. Patent No. 5,366,651. These references, and the reasons that they do not render the claimed methods obvious, have been discussed in detail by applicants in their prior responses to office action. For convenience, the argument from the immediately prior response regarding these references is reproduced below. In addition to these reasons, applicant addresses in more particularity the following arguments made by the examiner in the most recent Office Action.

At pages 7-8 of the Office Action, the examiner states that Meyer and Maes “suggest reducing the oral toxicity of nonaqueous fluids containing ethylene glycol by mixing with ethylene glycol in the specific proportions recited by the instant claims.” As pointed out

previously by the applicant, neither Meyer nor Maes recognize or discuss the problem of reducing the oral toxicity of ethylene glycol based fluids, much less describe, teach or suggest a method to reduce the toxicity of a non-aqueous ethylene glycol based fluid as recited in claim 30 as amended. Moreover, neither Meyer nor Maes describe, teach or suggest, combining ethylene glycol containing fluids with propylene glycol in any specific proportions, much less the specific proportions recited in claim 30 as amended, which results in a fluid having an unexpectedly large decrease in oral toxicity. At most, Meyer and Maes describe broad generic formulations that may, in some instances which are not specifically taught or described in either reference, encompass some of the fluids produced by the claimed methods. This is insufficient to support the rejection of the claims based upon either Meyer or Maes. See In re Baird, 16 F.3d 380, 382 (“The fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound obvious.”); MPEP § 2144.08.

At page 13 of the Office Action, the Examiner states that it would have been obvious to combine ethylene glycol and propylene glycol because each had previously been used in anti-freeze compositions. Where, as here, the prior art does not identify specific compositions that achieve an unexpected and desirable result, the claimed composition is patentable. The Examiner goes on to state that it is unclear what unexpected results are shown. In the specification of the present application at pages 20-24, the applicants describe in detail that the compositions unexpectedly exhibited oral toxicity that is much lower than would have been expected.

It had been known to those skilled in the art that the addition of a less toxic substance to a more toxic substance will result in a mixture that is reduced in toxicity compared to the toxicity of the more toxic substance **as a result of dilution** of the more toxic substance. The formula generally used to predict the LD₅₀ values for mixtures of substances, as published by the World Health Organization, is described in the specification at page 21. In the case of ethylene glycol,

a reduction in toxicity based only upon **dilution** does not result in a non-toxic or safe mixture except when the percentage of dilution is very substantial. The curve shown in Fig. 3 is generated using the formula described in the specification. In Fig. 3, the predicted LD₅₀ in rats for the claimed range of combinations of ethylene glycol and propylene glycol was about **6,000 mg/kg or less**. As described in the application, laboratory testing sponsored by the applicant surprisingly revealed that fluids containing substantial percentages of ethylene glycol when mixed with propylene glycol resulted in fluids that were far less toxic than predicted due to dilution. As set forth in the specification at pages 24-27, the inventors discovered that the claimed compositions had an LD₅₀ in rats of about **15,000 mg/kg or more**. Although the invention is not limited by any particular mechanism of action, the applicant believes that propylene glycol may act as an ADH enzyme inhibitor when it is mixed with ethylene glycol. The inhibiting action is believed to reduce or prevent the conversion of ethylene glycol to glycoaldehyde and to thereby reduce the toxic metabolites that are the essence of ethylene glycol poisoning.

Indeed, many skilled in the art still do not understand that combining propylene glycol with ethylene glycol will reduce the toxicity of the fluid well below the predicted toxicity for a given combination. As set forth in the Declaration of John Evans submitted herewith in paragraphs 8 and 9 and in Exhibit 1, many still believe that combining any amount of ethylene glycol with a propylene glycol based fluid will “eliminate the safety advantages” of the propylene glycol fluid. As described above, the present inventors discovered that, to the contrary, addition of relatively small amounts of propylene glycol to an ethylene glycol based fluid unexpectedly reduced the oral toxicity of the fluid to a level that was not predicted, and that, in some cases, was actually less than the toxicity of the pure propylene glycol.

Regardless of the mechanism of action, where, as here, a claimed range achieves unexpected results, the claimed range is patentable over a prior art description of generic ranges.

In re Woodruff, 919 F.2d 1575 (Fed. Cir. 1990); MPEP § 2144.05. For at least these reasons, in addition to the reasons reiterated below, the claims as amended are not obvious under 35 U.S.C. § 103(a) in view of Meyer and Maes.

Additional Reasons That Meyer Does Not Render the Claimed Invention Obvious

Meyer describes deicing solutions comprising alkylene glycols, water, corrosion inhibitors, and one or more polymeric additives. Meyer states at Column 2, lines 58-61 that the composition contains “up to 50 percent water” and preferably between 1 and 10 percent water by weight. Meyer does not describe a heat transfer fluid. Meyer describes a deicing fluid containing one or more polymeric additives. Meyer states at col. 1, lines 24-27 that polymeric additives are added to a deicing fluid to thicken the fluid (i.e. to increase the viscosity of the fluid). The required polymeric additives of Meyer’s composition are further intended to prevent precipitation of materials contained in the composition, and precipitation of materials contained in water that may be mixed with the composition. While polymeric additives may be desirable in a deicing fluid, they are generally undesirable in a heat transfer fluid.

It is known in the art that heat transfer is improved when the viscosity of a heat transfer fluid is reduced. At page 18 of the specification, the advantages of the reduced viscosity of EG and PG mixtures, as compared to the higher viscosity of PG alone, is discussed. At page 18, lines 4-5, the inventors note that “viscosity at any given temperature decreased as the percentage of EG increased.” Indeed, a major advantage of combining EG and PG in a non-aqueous heat transfer fluid is to decrease the viscosity of the PG, thereby increasing the performance of the heat transfer fluid. It would not be obvious to one skilled in the art to modify Meyer by removing the polymeric additive described for the deicing fluid in Meyer to arrive at the heat transfer fluid produced by the method of the present invention.

Moreover, the composition described in Meyer requires the presence of added water to maintain the additives described therein in solution. Indeed, Meyer states at Col. 2, lines 59-61

that the composition preferably contains between about 1 and 10 percent by weight water. All of the fluids described in Meyer contain some added water. As recited in claim 30 as amended, and as described in the specification, the composition of the present invention is non-aqueous, which is defined in the specification as meaning that there is no added water, and that water is present only as an impurity. As recited in claim 30 as amended, the only additives present in the fluids formed by the method of the present invention are soluble in ethylene glycol and propylene glycol. Meyer does not teach or suggest a fluid that does not contain added water.

For at least these additional reasons, the claims as amended are not obvious under 35 U.S.C. § 103(a) in view of Meyer.

Additional Reasons That Maes Does Not Render the Claimed Invention Obvious

Maes is directed to a corrosion inhibitor for use in aqueous solutions, and to antifreeze/coolant compositions containing such a corrosion inhibitor. *See* Maes at col. 1, line 8. Maes states that the invention described therein “is directed to a novel corrosion inhibitor composition for use in aqueous systems, an antifreeze/coolant concentrate containing the inhibitor composition and aqueous antifreeze/coolant compositions containing the inhibitor composition.” *See* Maes at col. 2, lines 54-58. Thus, Maes is directed primarily toward the corrosion inhibitor used in aqueous antifreeze/coolants.

Maes describes a fluid for use in aqueous solution comprising “a water soluble liquid alcohol freezing point depressant and a corrosion inhibitor comprising carboxylic acids or their salts and a triazole compound” Maes at col. 2, lines 62-65 (emphasis added). *See also* Maes at col. 9, lines 25-26 (claim 1 directed to a concentrate comprising “a water soluble freezing point depressant”) (emphasis added). Accordingly, Maes describes a composition having a single water soluble liquid freezing point depressant.

Maes does not teach or suggest combining ethylene glycol with propylene glycol for any purpose, much less for the purpose of forming a non-aqueous heat transfer fluid having reduced

oral toxicity. At col. 3, lines 65-69, Maes states that freezing point depressants suitable for the fluid he describes are “glycol” and “glycol ethers.” These are very different chemicals.

To those skilled in the art, the term “glycol” in the singular means ethylene glycol, a polyhydric alcohol with direct bonding between the carbon atoms. For example, in the Handbook of Chemistry and Physics, 42nd ed., in the listing of Physical Constants of Organic Compounds on page 992, the listing for “ethylene glycol” says merely “see glycol” with no data listed. The listing for “Glycol” on page 1016 provides data only for ethylene glycol.

Glycol ethers, on the other hand, consist of hydrocarbon groups bonded through an oxygen atom. At col. 3, line 69 through col. 4, line 8, Maes states, “The glycol **ethers** which can be deployed as major components in the present composition include glycols such as ethylene glycol, diethylene glycol, propylene glycol, and dipropylene glycol, and glycol monoethers such as the methyl, ethyl, propyl, and butyl ethers of ethylene glycol, diethylene glycol, propylene glycol, and dipropylene glycol.” The sole mention of propylene glycol by Maes appears in his listing of glycol ethers, i.e. as propylene glycol ether. Ethylene glycol, the preferred freezing point depressant in Maes, is listed at col. 3, line 67 as “glycol.”

Maes nowhere describes combining ethylene glycol and propylene glycol in any proportion. At col. 3, line 67, Maes’ reference to “depressants” in the plural is only in the context of introducing the listing of substances “which can be employed as major components in the present composition”. Col. 3, line 68 to Col. 4, line 1. Maes does not teach or suggest using combinations or mixtures of more than one alcohol freezing point depressant. Indeed in his listing of materials that can be used as “the major component” of the fluid, Maes does not state that combinations or mixtures of the listed substances could be used in the compositions described in Maes.

Throughout the specification and claims, Maes refers solely to the use of a single water-soluble liquid alcohol freezing point depressant as the major component in the anti-freeze

compositions described therein. All of the 16 examples provided by Maes contain only ethylene glycol as the alcohol freezing point depressant. *See* col. 5, line 3 to col. 6, line 54. In claim 1, the only independent claim in Maes, the composition is described as containing “a water soluble alcohol freezing point depressant.” (emphasis added). Accordingly, when the specification and the claims are read as a whole, it is plain that Maes teaches only the use of a single alcohol freezing point depressant in the composition described in Maes.

At col. 3, line 65 to col. 4, line 68, Maes states “The antifreeze formulations most commonly used include water and water soluble liquid alcohol freezing point depressants such as glycol and glycol ethers.” In this sentence, Maes uses glycol, which would be understood by one skilled in the art as ethylene glycol, in the singular and glycol ethers in the plural, and throughout the specification, Maes describes antifreeze formulations containing a single glycol, indicating that only a single glycol (i.e. ethylene glycol) is used in the formulation. Thus, Maes plainly describes the use of a single glycol and Maes does not teach or suggest any combination of glycols, much less the combination and proportions recited in the claims. Indeed, as discussed above, glycol ethers are not glycols at all, and the listing of propylene glycol in Maes is within the listing of glycol ethers, i.e. propylene glycol ether. This is not propylene glycol as claimed in the claims as amended.

For at least these additional reasons, the claims as amended are not obvious under 35 U.S.C. § 103(a) in view of Maes.

The Rejection Under 35 U.S.C. § 103(a) Based Upon Wood

Claims 30 and 40 also stand rejected under 35 U.S.C. § 103(a) in view of Wood, U.S. Patent No. 4,455,248. Wood describes an antifreeze composition for use in automotive cooling systems or other heat transfer services. Wood states that the composition “necessarily” contains sodium metasilicate. Col. 3, lines 27-55. As applicants previously demonstrated by specific evidence, although Wood states that “the antifreeze may be formulated as a concentrate using

little or no water”, (col. 3, lines 7-8), the requirement that the fluid described by Wood contain sodium metasilicate necessitates the addition of sufficient water for the sodium metasilicate to dissolve and remain in solution, i.e. in order for the sodium metasilicate to function. As set forth in the information sheet from the Occupational Safety & Health Administration, ([http://www.osha.gov/dts/chemical sampling/data/CH_267715.html](http://www.osha.gov/dts/chemical%20sampling/data/CH_267715.html)) sodium metasilicate is not soluble in alcohols such as glycols, but is readily soluble in water. Accordingly, for at least this reason, Wood does not teach or suggest a heat transfer fluid composition as recited in claim 30 as amended, which recites that the heat transfer fluid of the present invention contain no additive requiring the presence of water in the fluid to dissolve the additive or to enable the additive to function.

At page 14 of the Office Action, the Examiner states that Wood teaches that the compositions may contain “little or no water” in concentrates. Even in the description of the concentrates, however, Wood states that the concentrates typically contain added water. As described in the Declaration of John Evans submitted herewith, even in the concentrate form, it is necessary that the additives remain dissolved. Accordingly, to the extent that Wood suggests a fluid having sodium metasilicate and no added water, the fluid is not operative for its intended purpose.

Moreover, Wood specifically states that in use, substantial amounts of water must be added to the fluid. This is required to ensure that water soluble additives, such as sodium metasilicate, do not precipitate out of solution in use. As described in the Declaration of John Evans submitted herewith, precipitation of water soluble additives during use is a substantial problem with heat transfer fluids which can ruin a heat transfer system.

Finally, although Wood generally states that mixtures of glycols may be used in the anti-freeze compositions described therein, Wood does not teach or suggest combining ethylene glycol and propylene glycol in any specific proportions, much less in the proportions recited in

the amended claims. As described in the application, the present inventors discovered that adding relatively small amounts of propylene glycol to ethylene glycol unexpectedly resulted in a non-aqueous heat transfer fluid having substantially reduced toxicity. Wood does not teach or suggest combining ethylene glycol and propylene glycol in any specific amounts, much less in the proportions recited in the amended claims. Wood is therefore insufficient to support a rejection under 35 U.S.C. § 103(a). See In re Baird, 16 F.3d 380, 382 (“The fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound obvious.”); MPEP § 2144.08.

Accordingly, for at least these reasons, the methods recited in the amended claims are not described, taught or suggested in Wood, and applicants respectfully submit that the rejection under 35 U.S.C. § 103(a) based upon Wood is traversed based upon the amendments to the claims.

The Double Patenting Rejection

The Examiner has issued a provisional double patenting rejection citing four copending patent applications. Pursuant to MPEP § 804, if this is the sole remaining rejection prior to issuance of any of the copending applications as patents, this rejection should be withdrawn in this case. While Applicants do not admit that the claims of the present invention are obvious in view of any one of those copending applications, in the event that one or more of the copending applications issues as a patent prior to this application, Applicants will file a terminal disclaimer to obviate the double patenting rejection.


In view of the foregoing remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes after considering these remarks, that the application is not in condition for allowance, the Examiner is requested to call the Applicant’s attorney at the telephone number listed below.

Because the reasons above are sufficient to traverse the rejection, Applicants have not explored, nor do they now present, other possible reasons for traversing such rejections. Nonetheless, Applicants expressly reserve the right to do so, if appropriate, in response to any future Office Action.

A Petition for Extension of Time extending the deadline for submission of this paper until January 23, 2007 is filed herewith. No additional fee is believed to be required. If any fee is required, or if necessary to cover any deficiency in fees previously paid, authorization is hereby given to charge our Deposit Account No. 50-3569.

Respectfully submitted,

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By: 
Eric E. Grondahl
Reg. No. 46,741

PTO Correspondence Address:
McCarter & English
CityPlace I
185 Asylum Street
Hartford, CT 06103-3495
Phone: (860) 275-6704
Fax: (860) 560-5987

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